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ABSTRACT

The position of this paper is that evaluation is a type of research. This conclusion is based on philosophy of science concepts, the nature of scientific method, and evaluation literature. The argument is made that scientific method is one of several inquiry strategies, that the terms scientific method and research are synonymous, and that evaluation is a type of research located at the applied end of a basic-to-applied continuum. Following exposition of the basic argument, supportive discussions are presented related to the role of evaluators, the nature of evaluation problems, the manipulation and control issue, and the use of evaluation results. The following conclusions are made: (1) energy being devoted to evaluation theory development should be redirected to more productive pursuits; (2) evaluators should be capable of differentiating between evaluations for which research designs are appropriate and those for which they are not. If appropriate, the goal should be the maximum amount of manipulation and control feasible; (3) evaluation should be treated as an area of specialization within research training programs; and (4) research courses should treat evaluation as a type of applied research. (Author/RL)

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The Case for Evaluation As A Type of Applied Research

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Preface

This paper contains more quotes than one would normally expect in a professional paper. This heavy reliance on the literature, however, is a result of the nature of the paper. Its purpose is to support a particular point of view. It was decided that inclusion of direct quotes would eliminate conscious or unconsciousness misinterpretation of statements (or accusations of same).

It is also acknowledged that several sources are relied on more than others. The intent was to concentrate on one major work in each of the major areas of argument.

Lastly, it should be noted that with few exceptions, underlining is at this author's discretion, not the original author's. Underlining was done for the sake of clarity, to highlight the portion of a quote most relevant to the related argument.

The author gratefully acknowledges the assistance of L. R. Melvin in reviewing the literature upon which this paper is based.

The Case for Evaluation as a
Type of Applied Research

A major point of disagreement among professionals is the issue of whether evaluation is a type of research or a separate discipline. A related issue is whether evaluations should be based on research designs whenever possible, for example when comparison questions are involved such as: Does curriculum A lead to higher achievement than curriculum B? There is concensus that to be acceptable evaluations must conform to certain scientific criteria such as internal and external validity, valid and reliable measurement, and objectivity (Scriven, 1966). Scriven, for example, has stated that curricular evaluation is a fully appropriate goal for applied science. Those who support the position that evaluation is a separate discipline, however, argue that evaluation is significantly different from research on a number of dimensions and contrast the two as follows (Stufflebeam, Foley, Gephart, Guba, Hammond, Merriman, and Provus, 1971):

1. The purpose of research is to provide new, context free, generalizable knowledge. The purpose of evaluation is <u>not</u> to establish universal laws but to make possible judgments about some phenomenon. In evaluation the objective is <u>not</u>

"to establish highly controlled conditions in which possible sources of confounding are filtered out" but rather "to set up conditions of invited interference ..."

2. Researchers seek control and "must manipulate or intervene" and arrange conditions. The naturalistic settings characteristic of evaluation essentially preclude that control. The evaluator collects natural, uncontrived, uncontrolled data which allow all factors "to exert whatever influence they might."
3. The typical research design "measures the effects of some treatment or combination of treatments and produces data only at the termination of the experiment."
4. The researcher withholds the treatment from some participants for the sake of design, an ethically questionable practice.
5. The researcher seeks equivalent comparison groups, a strategy which tends to "wash out" effects.
6. Evaluation situations frequently do not meet research assumptions for statistical analyses.
7. Research involves limited, go--no go, decision rules.
8. Research precludes the continuous refinement which is characteristic of evaluation.

Those who support the position that evaluation is but a type of research argue that research and evaluation have the same general definition and purpose and that evaluation is on the applied end of the basic-applied research continuum. In response to the above eight points, they compare the two as follows:

1. The purpose of both research and evaluation is to solve problems, both involve decision making, and both involve steps which represent applications of scientific method.
2. Both research and evaluation do involve control and control is a necessary prerequisite for valid conclusions. Evaluations should utilize research design whenever appropriate. Many nonevaluation research studies are conducted in naturalistic real-world settings and are subject to the same control problems involved in evaluations.
3. While research designs do measure the effects of some treatment or combination of treatments, all designs can be easily adapted to involve the collection of effectiveness data at various points in time, not just "at the end."
4. There are a number of research designs (e.g., the time-series design) which permit all participants to receive the treatment.

5. Equivalent comparison groups do not wash out effects but rather allow the investigator to validly assess effects.
6. Evaluation situations are no more likely to involve assumption violation for statistical analyses than other types of applied research.
7. Evaluations frequently involve go--no go decisions. Further, the nature of statistical decision rules is such that they premit decision making at various levels of certainty.
8. Research, per se, does not preclude continuous refinement. While good research practice does encourage stability of conditions, an evaluation may be viewed as a series of research studies, each based on the results of the previous study. Further, any research study, including an evaluation research study, which frequently changes procedures, produces results which are difficult to interpret.

Proponents of evaluation as a separate discipline also argue that there are a number of practical and prudential criteria which must be applied to evaluations but which are not required of research efforts (Stufflebeam et al., 1971). These include: relevance, importance, scope, credibility (of both the evaluator and the data sources), timeliness,

pervasiveness (dissemination and use of results), and efficiency. Those who believe that evaluation is but a type of research argue that while some of these factors (e.g., timeliness) have been overrated, to the degree that they are important, they are important for other types of research as well.

The issue is an important one, the resolution of which has a number of implications. First, if there are significant differences between research and evaluation, there is a need for a comprehensive theory of evaluation; the current proliferation of evaluation "models" attests to this "need." If not, further futile efforts in this direction should be terminated. Second, if research and evaluation are significantly different, the practicing evaluator should be capable of differentiating between evaluations for which research designs are appropriate and those for which they are not and, if appropriate, the goal should be maximum manipulation and control. Third, if there are significant differences between research and evaluation, there should be separate training programs for individuals preparing to enter the respective fields. If not, then evaluation should be treated as an area of specialization within research programs. Further, whether or not research and evaluation are significantly different has implications at the individual course level. The appropriate treatment of evaluation in an introductory educational research course, for example, depends upon a resolution to the research versus evaluation controversy.

The position of this paper is that evaluation is a type of research. This conclusion is based on philosophy of science concepts, the nature of scientific method, and evaluation literature. Briefly, the argument will be made that scientific method is one of several inquiry strategies, that the terms scientific method and research are synonymous, and that evaluation is a type of research located at the applied end of a basic-to-applied continuum (see Figure 1). Following exposition of the basic argument, supportive discussions will be presented related to the role of evaluators, the nature of evaluation problems, the manipulation and control issue, and the use of evaluation results.

The Nature of Scientific Inquiry

In addition to being a body of knowledge, science is a process, a process of inquiry for answering questions, solving problems, and developing more effective procedures for answering questions and solving problems (Ackoff, 1962). Its aim is both understanding and control of phenomena (Ackermann, 1970). Not all inquiry is scientific. There are a number of nonscientific inquiry strategies, including common sense and logic. It has often been proposed that the difference between scientific and nonscientific inquiry is that the latter is concerned with more immediate and practical problems than is science. As Ackoff (1962) has pointed out, however, it has become increasingly clear that science, particularly applied science, does deal with immediate and

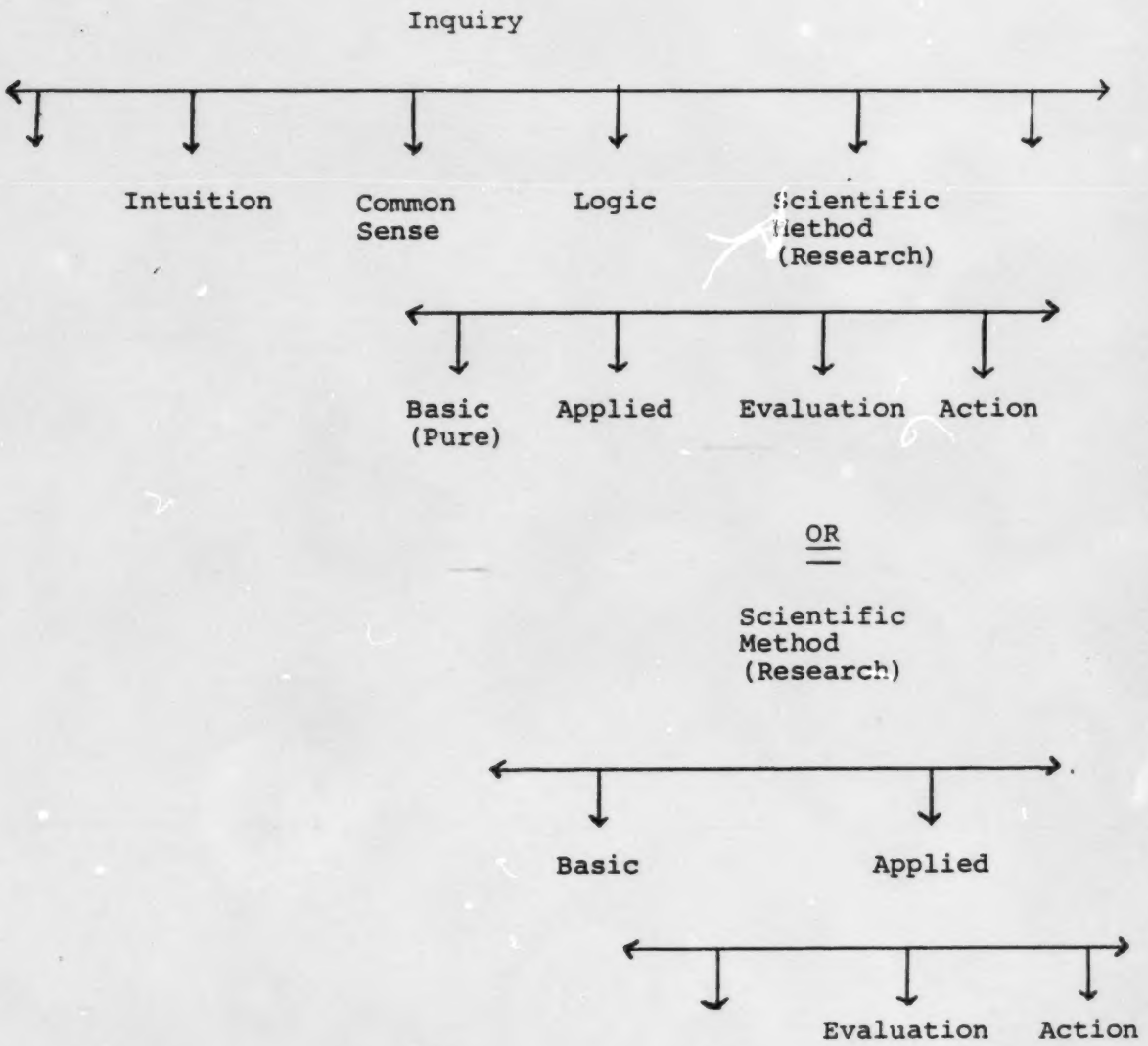

Figure 1. Inquiry strategies.

pressing problems. This is not to say that scientific inquiry is always to be preferred to nonscientific inquiry. There are some problems and decisions, such as selection of what clothes to wear to a social function, which do not justify the rigor of scientific inquiry. The need for scientific investigation is a function of the seriousness of the problem and the consequences of decisions.

As Cronbach, Ambron, Dornbusch, Hess, Hornik and Philips (1980) have stated: "To represent acceptable science, evaluation must incorporate the essential features of scientific process." One such feature is the social process of challenge and confirmation. In other words, procedures, data and conclusions must be available and open to scrutiny, thus permitting others to, for example, propose alternative interpretations or attempt replication. If it is agreed that acceptable evaluations represent acceptable science, then the argument for evaluation as research involves first supporting the position that scientific inquiry and research are synonyms.

A number of writers on the topics of philosophy of science, scientific method, and evaluation have used the terms "science," "scientific research," "scientific method," and "research" interchangeably. Ackoff (1962), for example, has stated that control is a necessary but not sufficient characteristic of <u>scientific inquiry</u> and that <u>science</u> is also characterized by the goal of self-improvement -- "to increase

without limit our knowledge and ability to answer questions and solve problems; this imposes the requirement on scientific research that it be conducted in such a way as to increase the efficiency of future research. Note that Ackoff includes "efficiency" as a criterion for any research effort.

It would be an oversimplification at best to say that true science requires statement of a problem, formulation of a hypothesis, design of an experiment, and acceptance or rejection of the hypothesis (Ackermann, 1970). The forms of statements which represent answers to research questions may be predictive, comparative or functional; the form of expressions in such statements may be qualitative or quantitative; and the scope of statements may be particular or general (Ackoff, 1962). In discussing the fact that there are many procedures which represent various scientific methods, Ackoff states that methods are rules of choice and the techniques are choices themselves. To use his example, a procedure for selecting the best of a set of possible sampling designs in a given situation is a scientific method, as is selection of the most appropriate measurement techniques. He further states that in scientific research there are methods of science, or scientific methodology involved in each of the various phases of research.

Philosophers of science, for the purpose of simplifying discussion, have made a common sense distinction

between basic, or pure, and applied science in order to differentiate studies involving varying degrees of control (Ackermann, 1970). Basic and applied science, however, represent ranges on a scale, not mutually exclusive categories. Basic research is often defined as research conducted not for utilization reasons but "for its own sake" or, since results are typically published, "for science's sake" (Ackoff, 1962). Thus, a distinction between basic and applied research is based on the nature of the intended consumers of the research results. But as Ackoff states, it is relatively rare that results of basic research do not eventually become "appliable," even if they are not actually applied. Further, if one bases the distinction between basic and applied research on the researcher's intentions, we are left with the following possibility:

> ...two research projects which are alike in all respects except for the intentions of the researchers involved, one pure and one applied. That is, the distinction is based not on a difference in the kind of research conducted, but on a property of the researcher. Furthermore, since the researcher's interest in application of his results outside the domain of science may vary in intensity and degree, this distinction seems ultimately to be quantitative rather than qualitative. This would explain in part the fuzziness of the distinction.

Ackermann (1970) echoes this sentiment by suggesting that various scientific activities are characterized by the methodology they employ, not by the nature of the problems investigated. He further states that philosophy of science involves

analysis of internal structure, without reference to the intentions of the investigator. Thus, it is a contradiction to say that research and evaluation both represent scientific investigation, on the one hand, and that the two are distinctly different due to the nature of their problems and intentions on the other.

Another principle of philosophy of science, paradigm conservation, also supports the view that evaluation should be considered as a type of research (Ackermann, 1970). The principle of paradigm conservation is that "maintenance of a past model is to be preferred over a completely new model, even at the expense of some closer fit to the data." The criterion of paradigm conservation does not preclude the introduction of completely new models or ideas, but it does suggest that they are not accepted into scientific practice unless it can be validly demonstrated that there are situations for which "old" models are clearly inappropriate.

It is neither surprising nor unusual for professionals to have greatly diverse opinions on an issue. Philosophers of science often disagree and scientists have traditionally been at odds regarding many fundamental concepts. A "classic formulation," however, is that "the strength of a belief should be proportional to the available evidence for that belief in a rational individual" (Ackermann, 1970). Data amassed during the last decade, for example, have made it more

"rational" ... accept the "Big Bang Theory" of the origin of the universe. Similarly, the weight of evidence suggests that scientific method and research are synonymous and that evaluation is a type of research.

Evaluation as a Type or Research

Support for the position that evaluation is a type of research comes from both indirect and direct references made by various professionals. Rodman and Kolodny (1971), for example, state that "the ultimate purpose of research ... is to evaluate as thoroughly as possible the effectiveness of practice," and that one aspect of the relationship between researchers and practitioners is "that the former may be evaluating the work of the latter." Schulberg and Baker (1971) suggest that "in seeking to conceptualize possible approaches to program evaluation, two research models stand out, the goal-attainment model and the system model." They contend that use of the system model is more conducive to "implementation of research findings," that "the system model, by focusing upon the various factors determining research design and interpretation of the data, offers more promise for programmatic utilization of the evaluation findings." Relatedly, Weiss (1971), in discussing evaluation procedures which promote utilization of results, states that one such procedure is clear and attractive presentation of evaluation data to "nonresearch" audiences.

In a more direct statement Scriven (1966), in discussing formative evaluation, states that "This kind of research is often called process research." Further, while he makes the case that not all research is evaluation research, he in no way suggests that the reverse is true, i.e., that not all evaluation research is scientific research. He states, for example, that "None of this shows that most research is evaluation research. In particular, even process research is not all evaluation research." Schulberg and Baker (1971), in discussing the difficulties involved in trying to apply research findings, suggest that the problem is particularly acute "in the research specialty of program evaluation. They also state that "although evaluation research usually is distinguished from other research by virtue of its closely knit relationship to program planning, only rarely has this interweaving been evident in fact." Ackoff (1962) also treats evaluation as a form of research. Implicit in Ackoff's discussion of research problems is that it is a fallacy to differentiate evaluation from research on the basis that evaluation involves decision making and research does not. He states that research that is directed toward problem solving can also be classified as evaluative and developmental. An evaluation problem is a problem "in which the alternative courses of action are completely specified in advance and the solution consists of selecting the 'best' of these." He also

suggests that applied research has the advantage of "being able to formulate criteria of its own efficiency in terms of the objectives for which the problem is being investigated," and that in applied research "it is necessary to translate the decision maker's problem into a research problem." This translation requires a complete identification of the components of the decision maker's problem which are:

1. the decision maker(s),
2. his (or their) relevant objectives,
3. the possible courses of action,
4. the context: those aspects of the problem environment which, though not subject to the decision maker's control may affect the outcome of his choice of action. These may be:
   a) "acts of nature," or
   b) acts of other decision makers: reactions or counteractions.

He goes on to suggest that involvement of the decision maker (and those who carry out the decision) in the research before results are obtained is much more efficient than trying to "sell" the results after they are obtained, and that despite some belief to the contrary, the decision maker's objectives usually have to be extracted and clarified by the researcher.

The argument that research and evaluation cannot be differentiated based on the assertion that evaluation involves decision making is supported by the writings of Cronbach et al. (1980) which also make both indirect and direct references to evaluation as a kind of research. They state that while a decade ago it made sense to differentiate between conclusion-oriented and decision-oriented research, with evaluation falling in the second category, they are

joining "other current writers who see evaluation as contributing to conclusions of fresh perceptions ..." They further indicate that in evaluation evidence is collected on experience with an already existing program or one installed for research purposes. They also suggest that the contract for an evaluation too often "rigidifies" the process:

> Research whose prospective operations are unspecified or are open to change is uncongenial to the bureaucracy that contracts for an evaluation; such research is unpredictable and therefore risky. Programmatic support has, however, paid off in basic research, where only a general direction of inquiry is foreseen.

The above quote also clearly negates the argument that research precludes the continuous refinement which is characteristic of evaluation.

More directly, Cronbach et al. discuss "social research, including evaluations," characterize evaluation as "research-linked-to-decisions," and support the assertion that "systematic evaluative research necessarily takes many forms." Their position is best summarized by the following quote:

> We see evaluation as an integral part of policy research, and we therefore blend ideas appearing in the policy-research literature with ideas about evaluation itself. The distinction between evaluation and policy-research activities is beginning to disappear, as members of one subcommunity come to appreciate the ideas springing up in the other.

The Role of the Evaluator

Various discussions related to the role of the evaluator support the assertion that while not all researchers are evaluators, all evaluators are researchers. Rodman and Kolodny (1971), for example, point out that the evaluative aspect of the researcher's job is one, but not the only, reason for "organizational strains" between researchers and practitioners. They suggest that "pre-evaluative collaboration work" reduces practitioner defensiveness, teaches researchers about the complexities of the real world, and is conducive to mutual respect. Argyris (1971) indicates that part of the researcher's role is to help the subjects (management, employees, etc.) to perceive the research as meaningful and helpful. Ackoff (1962) suggests that not all sponsors of research are solely, or even primarily, motivated by a desire to solve the proposed problem. Sponsors may have any number of personal motives and it is the researcher's responsibility to see to it that results are used as they should be. Relatedly, Mann and Likert (1971) maintain that the researcher can "sidestep many of the individual and group protective mechanisms which are set into action during any real evaluation of the self or the organization in which the self is deeply involved."

Cronbach et al. (1980) also address the issue of the role of the evaluator. They suggest that the evaluator should be far more than a passive technician who applies skills,

writes a traditional scientific report, and departs. The evaluator should play an active role, both politically and scientifically, and make suggestions before the final evaluation contract is drawn up.

Problems

Discussions of scientific method and scientific problems make it clear that evaluation problems are also research problems. According to Ackoff (1962), "Where problems are solved by scientific research, if any of the objectives involved are nonscientific in character, the research is thought of as applied." He states that the minimal necessary and sufficient conditions for the existence of a problem are as follows:

1. An individual who has the problem; the decision maker.
2. An outcome that is desired by the decision maker.
3. At least two unequally efficient courses of action.
4. A state of doubt in the decision maker as to which choice is "best."
5. An environment or context of the problem.

Problems may be considerably more complex as a result of the following:

1. A group of individuals, not one, must make the decision.
2. The decision maker(s) make the decision but others carry it out.
3. The decision may have an effect on others who react to it in such a way as to affect its efficiency.

4. More than one objective may be involved in a problem and the objectives may not be consistent (e.g., wanting to save money and increase achievement when such is not feasible).
5. The number of possible courses of action may be very large.

Ackoff goes on to state that to solve a problem is to make the best choice from among the available courses of action (the choice a decision maker should make, not necessarily the one actually made). Of course, as Ackoff points out, it is not at all obvious what is meant by the "best" solution to a problem. A definitive definition of "best" has "not yet been attained, and it is not likely that it ever will be." Lastly, he states that "any problem situation, and hence research problem situation," can be analyzed in terms of the measure of performance or accomplishment we wish to maximize or minimize, the aspects of the situation we can control, and the aspects of the situation (environment of the problem) over which we have no control." And, relatedly, he acknowledges that analysis of the problem's context can be a very time consuming, costly process.

Manipulation and Control

As noted earlier, proponents of evaluation as a separate discipline argue that unlike research, evaluation does not seek manipulation and control. Implicit in this argument is the idea that research and experimentation are synonymous. The literature, however, supports the views that 1) research is

not synonymous with experimentation, 2) all evaluations do not require experimentation, and 3) if experimentation is required, the maximum manipulation and control feasible should be the goal. As Weiss (1971) has stated:

> The achievement is that good evaluations can be done at all, and yet they are. They use appropriate change criteria and relatively reliable measuring instruments; they use control groups or apply other checks to rule the possibility that observed effects are attributable to nonprogram factors; their statistical methods and interpretation are sound. If they are not models of exemplary or sophisticated methodology, they do meet the basic cannons of research.

According to Ackoff (1962), one of the major functions of a methodological standard in science is that it provides "a basis for determining the extent to which any research is controlled, and hence scientific." He further states that not all scientific research involves experimentation, that while experimentation is synonymous with manipulation, manipulation is not synonymous with control (Astronomy, for example, represents scientific research but certainly not experimentation), and that control of research is exercised to various degrees. Total control is an unattainable goal since every inquiry has some controlled and uncontrolled aspects. As Schulberg and Baker (1971) suggest, however, when appropriate, evaluation research should strive to approximate the experimental model as much as possible, and if this is not feasible than quasi-experimental designs should be applied.

Cronbach et al. (1980) support the above mentioned authors and further state that an evaluation may represent studies within studies or a series of studies. The evaluator either studies events as they are found or arranges them for the sake of investigation. In the spirit of maximizing manipulation and control where appropriate, there may be randomized designs within quasi-experimental designs or vice versa. They further state that sacrificing external validity (generalizability) for the sake of internal validity (control) or sacrificing internal validity for the sake of external validity are equally unsatisfactory approaches, and a balance has to be worked out to fit the particular evaluation. This statement would seem to be in opposition to the point of view that maximum manipulation and control should be the goal and the point of view that the evaluator should collect natural, uncontrived, uncontrolled data. They also state, however, that if an investigator knows what question is significant to the policy makers, s(he) bears down on the population, treatment(s), and dependent variable(s) that best match that question:

> He tries to design a highly replicable study. The larger his sample and the better he controls sampling, delivery of treatment, and quality of outcome measure, the less uncertainty remains when he is finished.

This statement certainly supports the assertion that while what is actually feasible will vary from evaluation to evaluation, the goal should be to maximize manipulation and control as much as possible.

Utilization of Results

Writings related to utilization of evaluation results clearly suggest that one of the major reasons for lack of utilization is failure to treat evaluation as research. In discussing change, for example, Cronbach et al. (1980) state that it is the evaluator's task to provide the decision maker with the information necessary to make judgments and that "in the long run, research and theory (including program evaluations) contribute to alterations in the framework..." (Rein, 1976). In the short run, the impact of an evaluation may not be obvious:

> The evaluator expects to stimulate change. Some observers lament that refined and technical social research can produce only meliorist criticism of institutions and programs. But to be meliorist is the evaluator's calling. Rarely or never will evaluative work bring a 180-degree turn in social thought.

Weiss (1971) directly states that a major limitation on the utilization of evaluation results is "the current state of evaluation practice", and that "much evaluation is poor, more is mediocre." Weiss suggests that utilization of evaluation results might be increased if, among other things, the theoretical premises underlying the program, and the evaluation approach to analyzing these premises, were made clear. Further, if this were done, more evaluation findings would be likely to be "comparable and additive and contribute to the building of knowledge." The need for theoretical

bases and explanations of results is echoed by Ackermann (1970) and Argyris (1971). Argyris, for example, states that scientists shun results not based on "good" theories. Relatedly, Cronbach et al. (1980) state that "the full meaning of even the best study will become apparent only when its findings have been integrated with information developed concurrently by other sources, and even that interpretation will be modified by later experience."

Two other aspects of result utilization are report preparation and timing, issues addressed by Mann and Likert (1971), Schulberg and Baker (1971) and Cronbach et al. (1980). Mann and Likert recommend that results be presented in simple, nontechnical language and in graphical form so as to make them meaningful to nonresearch audiences. Schulberg and Baker concur. Cronbach et al. report that one of the most frequent complaints about evaluations is that "reports come in late and so perform no function - research and interpretation are compressed in time for the sake of delivering the report to a waiting decision maker as early as possible." But they note that recent studies (e.g., Weiss, 1977) indicate that "timeliness is a much-overrated concern" for two reasons: 1) evaluations have effects through informal channels all during the evaluation, and 2) the final report has long-term impact. Thus, the evaluator should be concerned more with the evaluation's long-term effects than with its short-term impact.

Conclusions

The "weight of evidence" supports the position that evaluation is a type of research. Therefore, the following conclusions seem warranted:

1. Energy being devoted to evaluation theory development should be redirected to more productive pursuits.
2. Evaluators should be capable of differentiating between evaluations for which research designs are appropriate and those for which they are not. If appropriate, the goal should be the maximum amount of manipulation and control feasible.
3. Evaluation should be treated as an area of specialization within research training programs.
4. Research courses should treat evaluation as a type of applied research.

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